George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

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March 14, 2001

ORGANIZATIONAL INSTRUCTION

Flight Projects Directorate
Ground Systems Department
FD40

Ground Systems Design and Development

Revision A

APPROVAL

NAME	TITLE	ORG	DATE
Original Signed by	Manager, Ground Systems Department	FD40	March 14, 2001

Ann R. McNair

CHECK THE MASTER LIST—
VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE

DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		9/14/99	Baseline version
Revision	Rev. A	3/14/01	Document reformatted to Flight Projects Directorate standard template.

1.0 GENERAL INFORMATION

1.1 Scope

This instruction describes the design and development of Ground Systems needed for successful mission support.

1.2 Purpose

To provide a step-by-step outline of Ground Systems progress from Task Agreement to actual operations.

1.3 Applicability

This instruction is applicable to the Ground Systems Department (GSD) of the Flight Projects Directorate (FPD).

2.0 APPLICABLE DOCUMENTS

Revision levels of documents are not shown. The latest revision will be used unless otherwise required by contractual requirements or other regulations. In this case the letter revision of the document will be given.

FPD-OI-FD40.10	HOSC Problem Report
FPD-OI-FD43.2	HOSC Configuration Request
MSFC-PLAN-904	HOSC Functional Requirements and Implementation Plan
MSFC-PLAN-2929	Configuration Management Plan for the HOSC

3.0 ACRONYMS and DEFINITIONS

3.1 Acronyms

ECR	Engineering Change Request
FPD/FD	Flight Projects Directorate
GSD	Ground Systems Department
HCR	HOSC Configuration Request
HOSC	Huntsville Operations Support Center
HPR	HOSC Problem Report
HW or H/W	Hardware

IV&V	Independent Validation and Verification
OTS	Off-the-Shelf
SW or S/W	Software
TReK	Telescience Resource Kit

3.2 Definitions

Collaborative Work Commitment A Collaborative Work Commitment is a document that defines the tasks and resources required to accomplish in-house work for the next fiscal year and represents proof of commitment by the Project Manager, Task Manager, and the Supporting Organizations to provide the resources.

Engineering Change Request A proposed engineering change used by MSFC personnel to submit documentation for initial baselining or to process changes to the baseline for evaluation and disposition by the appropriate Configuration Control Board.

HOSC Configuration Request To be supplied.

HOSC Problem Report A report that may be initiated by anyone to report problems encountered with hardware, software, facility, or other services provided by the HOSC during simulations, testing, flight, or off-line activities.

Independent Validation and Verification To be supplied.

Off-the-Shelf To be supplied.

Task Agreement A task agreement is a document used to acquire goods and/or services from other organizations within NASA (i.e., a Customer Agreement)

4.0 INSTRUCTIONS

4.1 Develop Project Plan

Develop project plan, quality plan, and schedules based on the Task Agreement and Program Requirements.

RESPONSIBLE PARTY: Manager, Ground Systems Department

4.2 Develop System Requirements

Develop Systems Requirements that will be followed throughout the design and development of the mission operations Ground Systems and conduct the associated requirements review with the customer/users.

RESPONSIBLE PARTY: Manager, Ground Systems Department

4.3 Develop Detailed Hardware and Software Specifications

Develop the detailed specifications and configurations for hardware and software and conduct the associated preliminary/detailed design reviews with the customer/users.

RESPONSIBLE PARTIES: Group Lead, Mission Systems Development Group
Group Lead, Mission Support Systems Group

4.4 Develop Plans and Procedures

Develop the associated operations support plans, training methods and operations procedures to operate and maintain the associated hardware and software.

RESPONSIBLE PARTY: Group Lead, Mission Systems Operations Group

4.5 Hardware and Software

Develop/procure & maintain hardware & software system components.

4.5.a OTS hardware/software is obtained as needed. Where appropriate, problem reports are used to communicate the necessary fixes/upgrades to the OTS providers for hardware and/or software items.

RESPONSIBLE PARTIES: Group Lead, Mission Systems Development Group
Group Lead, Mission Support Systems Group

4.5.b Custom hardware/software is developed and/or maintained as needed. Where appropriate, problem reports are used to communicate the necessary fixes/upgrades to the OTS providers for hardware and/or software items.

RESPONSIBLE PARTIES: Group Lead, Mission Systems Development Group
Group Lead, Mission Support Systems Group

4.6 Conduct Development, Integration, & Testing

Development, integration & testing on hardware & software is conducted.

RESPONSIBLE PARTIES: Group Lead, Mission Systems Development Group
Group Lead, Mission Support Systems Group

4.7 Deploy Mission Configuration

The complete mission configuration is deployed.

RESPONSIBLE PARTIES: Group Lead, Mission Systems Development Group
Group Lead, Mission Support Systems Group

4.8 Perform Independent Validation and Verification

Independent validation and verification (IV&V) is conducted in the mission configuration.

RESPONSIBLE PARTIES: Group Lead, Mission Systems Development Group
Group Lead, Mission Support Systems Group

4.8.a Problem reports, if any, are forwarded to those responsible for upgrading OTS hardware/software and/or for maintaining custom hardware/software (4.5 above).

4.9 Perform Operations Acceptance Testing

After IV&V, operations acceptance testing is performed.

RESPONSIBLE PARTIES: Group Lead, Mission Systems Development Group
Group Lead, Mission Support Systems Group
Group Lead, Mission Systems Operations Group

4.9.a Problem reports, if any, are forwarded to those responsible for upgrading OTS hardware/software and/or for maintaining custom hardware/software software (4.5 above).

4.10 Management Certification

Successful acceptance testing allows management certification of acceptable ground system performance in order to support actual flight mission operations.

RESPONSIBLE PARTY: Manager, Ground Systems Department

4.11 Perform Operations

Support actual flight missions operations.

RESPONSIBLE PARTY: Mission Systems Operations Group Personnel and Contractor Support Personnel

5.0 NOTES

None

6.0 SAFETY PRECAUTIONS AND WARNING NOTES

None

7.0 APPENDICES, DATA, REPORTS, AND FORMS

None

8.0 QUALITY RECORDS

The Quality Records for this Organizational Instruction are listed in the table below.

Record Title	Description of Record	Authority	Retention	Notes
Engineering Change Request (ECR)	See MSFC-PLAN-2929.	MSFC-PLAN-2929	Retain for 5 years after HPR's have been closed.	
HOSC Problem Report (HPR)	Used to report problems with hardware, software, facility, or other services provided by the HOSC.	FPD-OI-FD40.10	Retain for 5 years after HPR's have been closed.	

9.0 TOOLS, EQUIPMENT, AND MATERIALS

None

10.0 PERSONNEL TRAINING AND CERTIFICATION

None

11.0 FLOW DIAGRAM

Figure 1 graphically depicts the procedure stated in Section 4.0 of this document.

FIGURE 1: Ground Systems Design and Development Process